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FOREST INSECTS

SPRUCE BUDWORM (*Choristoneura fumiferana*) The results of the control operation on 217,000 acres of balsam fir forest in northern Maine were very good. Almost all of the spray blocks showed very nearly 100 percent reduction, with the exception of a few which brought the overall average to 97.5 percent of the prespray population. The aerial survey revealed discernible defoliation confined to the control area and a few small drainages nearby with the exception of one area outside the south and west corner. This important area comprises about 10,000 acres, 5,000 of which are heavily defoliated and the remaining 5,000 light to medium. The egg mass survey, which is not complete at this time, shows heavy deposition in part of this area as well as in a small number of scattered locations, all outside and eastward of the spray area.

BALSAM WOOLLY APHID (*Adelges piceae*) In Vermont new mortality is quite spectacular in spots. Perhaps last year's "mild" winter has favored a buildup in these areas.

PINE SAWFLIES New foliage is developing rapidly on most pines damaged by *Neodiprion sertifer* in New York and southern Connecticut. Unless extremely dry weather follows defoliation, pines recover well but the tree's ability to recover is gradually diminished as defoliation continues for several years on the same tree. Dry weather favors development of secondary insects such as bark beetles in trees weakened by successive defoliation. On sites where red pine has difficulty approaching pulpwood size before it ceases to grow, growth loss from defoliation may be sufficient to prevent that tree from ever reaching pulpwood size, thus a return on the original investment in the planting will never be realized. The red-headed pine sawfly (*N. lecontei*) was noted feeding on red pine in northern New York and Dutchess County as well as in New Castle County, Delaware. First larvae of this species were noted near Lowville, New York on July 5. Results of the aerial survey this year for *N. pratti pratti* in Maryland, Virginia, and North Carolina are not yet available.

A special report on the outbreak to date on this sawfly is available through the Northeastern Station (McIntyre, T., 1960. The Virginia pine sawfly outbreak 1955-59. Northeast. Forest Expt. Sta., Forest Res. Note 99. 4 pp.).

N. pini-rigidae has become much more prevalent in New Jersey south of Trenton where it is now commonly found on pitch pines. Second generation larval activity should begin within two weeks. Mortality from frost in late instars of the second generation of this species is not uncommon in late September or early October. Populations of N. pratti paradoxicus are declining in New Jersey but have been replaced by increasing populations of N. pini-rigidae. In New Jersey a pathogenic fungus found on N. sertifer eggs is being applied to eggs of N. pini-rigidae as a small scale preliminary study.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) This insect is becoming a common pest on ornamental red pines in the Portland, Maine, area.

WHITE-PINE WEEVIL (Pissodes strobi) Populations of this perennial menace continue at high levels throughout the region. Massachusetts reports it to be heavier than in the past several years. In Vermont it is becoming an important pest of Colorado blue spruce in Christmas tree plantings and nurseries.

PINE LEAF APHID (Pineus pinifoliae) This insect is heavier than expected in north central and eastern Vermont, while in the south central portion of the State, where former infestations have been heaviest, the population has decreased from last year. A limited experimental control project using a Solo mistblower and 6 percent Sevin W in water gave excellent control when sprayed on new shoots when first exsules had just commenced migration to the shoots in the spring of 1959. Similar treatments with lindane, malathion, and phosphamidon gave unsatisfactory control. On May 20 exsules were laying eggs in masses up to 52 in eastern Maine.

MISCELLANEOUS INSECTS ON CONIFERS The Nantucket pine moth (Rhyacionia frustrana) is very heavy on Scotch pine in New Castle County, Delaware, as well as around Wareham, Massachusetts, where pupation was noted about July 21. An unidentified pine tip borer has been found infesting the outer 2 or 3 inches of the current year's growth of pitch pine in Old Orchard, Maine. The yellow-headed spruce sawfly (Pikonema alaskensis) is reported damaging ornamental white spruce in several areas of New York State and in Maine. To date it has not become a serious pest in plantations. In Maine the arborvitae leaf miner (Argyresthia thuiella) is light in the New Sharon area, but moths were abundant in Sanford on coast white cedar during July. The pine tube moth (Argyrotaenia pinatubana) is heavy on white pine in Delaware. An unidentified pine looper infestation of pitch pine is developing in the Cape Cod area. The pine root collar weevil (Hylobius radicis) continues to kill Scotch pine in plantations around Poughkeepsie, New York and in several areas of Essex and Clinton Counties, and near Lyonsdale, New York. The larch sawfly (Pristiphora erichsonii) is light on larch near Raybrook, New York. The spittle bug (probably Aphrophora parallela) is heavy in a white pine plantation near Berne, New York. Ips pini is heavily infesting a pine plantation in Jefferson County, New York. Pissodes approximatus is reported in Harrisville, Pinckney, and New Bremen, New York on Scotch, red, and occasionally white pine in dead or dying conditions.

FOREST TENT CATERPILLAR (Malacosoma disstria) Populations have increased generally in Massachusetts this year and in the vicinity of Jamesburg, New Jersey.

GYPSY MOTH (Porthetria dispar) An overall aerial survey of the New England area has been completed by the Pest Control Division of A.R.S. but results are not yet available. In Vermont moderate defoliation was observed in small patches between Burlington and Fair Haven. Around Lake Dunmore, Vermont, defoliation is generally equivalent to the previous high in 1951. Infestations were spotty throughout Massachusetts. New York reports noticeable defoliation and some stripping in Schenectady, Albany, and Rensselaer Counties. A parasitic fly (Compsilura ?) was prevalent in unsprayed gypsy moth infestations near Raybrook, New York. Wilt disease has been generally noted throughout areas of 1960 infestation, but its prevalence is not expected to significantly affect next year's population.

OAK LEAF ROLLER (Argyrotoxa semipurpurana) Last month's PEST REPORTER noted leaf roller damage in the Kingston-New Paltz, New York, area which has since been confirmed as A. semipurpurana. Defoliation in Orange and Sullivan Counties, New York, and adjacent areas south of route 97 in Pennsylvania may have been caused by this same insect although no confirmation of this has as yet been received.

MISCELLANEOUS INSECTS ON HARDWOODS The maple petiole borer (Caulocampus acericaulis) was a common pest in Dutchess County, New York, and in southern Connecticut earlier this season. The large aspen tortrix (Archips conflictana) is still very active in eastern Clinton and Essex Counties, New York. An unidentified leaf roller has been noted on red oaks in the Ticonderoga and Clintonville areas. A report of a canker-worm infestation on Martha's Vineyard, Massachusetts, has been received. The asiatic oak weevil (Cyrtopistomus castaneus) is heavy on oaks throughout Delaware. In Vermont the maple leaf cutter (Paraclemensia acerifoliella) is responsible for some branch mortality after successive annual defoliation in a sugar bush. Other factors such as overtopping and grazing had probably weakened the trees so that branch mortality did occur. The oak twig pruner (Hypermallus villosus) is more common than usual in Vermont, Massachusetts, and Connecticut. The elm leaf beetle (Galerucella xanthomelaena) is common throughout the region this year. The solitary oak leaf miner (Cameraria hamadryadella) has been noted in Clinton County, New York, but elsewhere populations are down from last year.

FOREST DISEASES

Rains were adequate and generally well distributed during the early part of the 1960 growing season. Favorable conditions existed for many pathogenic fungi causing foliage and rust diseases. Temperatures during this period were frequently below normal and the sporulation of many fungi was longer than usual. Many foliage and rust diseases became established, as moisture and lush, tender foliage favored infection. Cooler than normal temperatures somewhat slowed disease development.

Midseason conditions, starting with July, have not been so favorable. Secondary spread of foliage diseases has been delayed as temperatures somewhat below normal and drought, although not extensive, occurred. These drought periods have been broken by rains before becoming serious for the deeper rooted shrubs and trees.

As a result, foliage and rust diseases probably are more numerous than usual, but little damage has resulted so far. The dry weather of late June and early July, following the lush growth of early spring, has apparently caused widespread leaf scorch, principally on sugar maples not in prime condition. Disease reports for the second

issue of the PEST REPORTER have been rather meager, which indicates that early favorable disease conditions have been at least temporarily halted by later more unfavorable conditions for many diseases, especially foliage diseases.

FOLIAGE DISEASES A number of foliage diseases are widely distributed, few or none of them serious. Early season conditions were favorable for the anthracnoses, but later developments were not. Their development was arrested and the affected trees refoliated, so damage has been slight. In Massachusetts sycamore anthracnose was prevalent, later stages very light. Other anthracnose-affected plants include maple, hickory, and oak. Maple anthracnose affected sizeable areas of sugar maple, as noticed from the air. Leaf blotch of horsechestnut is widely distributed and often-times prevalent, but infections are generally light. A number of leaf spots have been reported and observed, all of which seem to be of minor importance. The most serious seems to be ink spot of aspen, which is severe in parts of Maine and New Hampshire. The latter source tells of its worsening condition and states, "this is a bad year for the disease." Another New Hampshire report tells of Septoria leaf spot severe enough to cause the death of many leaves on seedling paper birch, and Maine also reports foliage disease on beech and yellow birch. It is suspected that foliage disease would have been more noticeable this year if the severe and widespread insect defoliation of many species had been less.

WILTS This year's trend for Dutch elm disease is difficult to assess. It seems that its severity corresponds to its severity last year. Reports have been received from New York, Vermont, Massachusetts, New Hampshire, and Pennsylvania, some saying it is worse, others that it is about the same as observed last year. The disease is also reported as very conspicuous in northern New Jersey and northeastern Pennsylvania. A Vermont report states that two towns have started replanting programs because of the disease.

No specific reports of other wilts are on hand, although Vermont says that Verticillium and Phytophthora associated with maple dieback is still going strong. Maple wilting is prevalent in Essex and Clinton Counties, New York -- cause not specified. A report from Pennsylvania says that Norway maples are declining in greater numbers, and efforts to isolate Verticillium have not been as successful as in previous years. Perhaps there is another cause, or causes, of the trouble. Elm complaints are running heavy in parts of New York State.

We have very little on the oak wilt situation. Pennsylvania has received 227 oak samples for culturing, as compared to 181 last year. It is stated that the number of new oak wilt areas found remains much the same from year to year.

RUSTS Early season indications that rust diseases might be prominent this year generally seem to have been correct. White pine blister rust remains more or less static due to control activities. Reports are variable, as shown by four from New York State. A report from the Lowville section tells of the heaviest infection of ribes noted in recent years; one from Fulton County notes a buildup of ribes infection; while two from the southeastern part of the State report infections as being generally light. Light infection to small reproduction, with the heaviest occurring in Rensselaer County, western Albany, and Green Counties is reported, while the Dutchess-Westchester region reports its occurrence, but not as being serious due to age of trees and the absence of ribes as a result of prior eradication.

A report on sporulation of white pine blister rust from the Durham area of New Hampshire helps to explain the low incidence of infection in the coastal areas. Weather conditions were reported to be at least partially responsible for the poor

production of teliospores. Examination of 1,000 telial columns from gooseberry leaves on water agar after 48 hours at 18°C. gave an average number of basidia, sporidia, and germinating sporidia as 20-75-35, respectively. At least 1,000 sporidia would normally be expected to be produced from a good telial column.

Of the miscellaneous rusts, ash leaf rust appears the most damaging. Heavy ash infections are reported in the coastal salt marsh areas from New Hampshire to Connecticut. This coastal strip of infection extends inland 5 to 10 miles, where salt marshes are extensive. Vermont reports that Gymnosporangium rust is heavy this year. Hollyhock rust is reported as heavy from Essex County, New York.

CANKERS A New Hampshire report on beech-scale-Nectria tells of Nectria sporodochia (fruiting structures) being abundant, and of the hyperparasite, Gonatorrhodiella highlei, occurring in fair amounts vigorously attacking the Nectria phase of the disease. This hyperparasite seems more abundant in open stands. A ladybird predator was noted feeding on the scale phase, and as it moves freely over the fungus in search of the scale, then may fly to other trees, it is suspected that the ladybird beetle may be a vector for the fungus.

A report from New Hampshire states that roadside maples continue to decline and bleeding cankers occur on some of them. Vermont also reports the Phytophthora bleeding canker present on many maple dieback trees.

ROTS Reports of Fomes annosus infections were received from a number of sources: A heavy infection of red pine noted in Holderness, New Hampshire; as "the principal cause of red pine and other conifer mortality" in Dutchess and Westchester Counties, New York; a new red pine infection noted near Woodstock, Vermont; and, a salvage cut in a red pine plantation near the Meshomasic State Forest in Connecticut, made because of the disease. It is encouraging to note the increasing concern by foresters and others in F. annosus problems. The number of people who are familiar with the disease, and how to look for evidence of it, has increased greatly. The disease is being observed in a number of study plots by various people in New Hampshire, Massachusetts, New York, Connecticut, Pennsylvania, and West Virginia. It is hoped that information gained from these studies will be exchanged freely and better means of controlling damage may result from them.

NURSERY AND PLANTATION DISEASES The main impact of the root rot disease complex at the Vermont State Forest nursery, previously noted, is apparently past although still of importance. An experimental area has been set aside from nursery production for study purposes of nursery pest difficulties.

A short investigation in New Hampshire on the fungi associated with yellow birch seeds has been completed. It was noted that "several fungi carried on seeds can attack the germinates and young seedlings. The most frequently isolated fungus was a species of Coniothyrium. Pycnidia of Cytospora occurred on many fully developed seeds." [A. L. Shigo].

Rhabdocline-Adelopus infections in Douglas-fir Christmas tree plantations progressively becomes worse and there is little hope for such infected plantations. Certain resistant trees will survive and a choice of a few more resistant ones may provide breeding material for future plantings.

MISCELLANEOUS TROUBLES Cytospora sp. is reported by Massachusetts sources on Sorbus and hemlock. A species of Cytospora is suspected as the cause of Japanese larch dying in the Lowville section of New York. A Cytospora has been previously mentioned as occurring on yellow birch seed. Other miscellaneous organisms reported include Phoma sp.

on blue spruce (Massachusetts), Xylaria polymorpha on butternut (Massachusetts), and bacterial slime flux on elm (New Hampshire).

The following unexplained tree troubles reported for this issue include: Ash dieback -- additional ash (both white and green) continue to die in the Poughkeepsie area. Foliage is yellowing and becoming progressively thinner. A very few trees were seen putting out a flush of tiny leaves in some of the topmost branches. These trees are not expected to recover. The most severe ash decline area seems to be pocketed along the Hudson River valley between Westchester County and the Albany district to the north, east, and west between Routes 9 and 22. A second small concentration of dying ash is on a ridge east of Roscoe, New York. Otherwise, dying ash can be found scattered in roadside and hedgerow plantings throughout the Northeast together with apparently healthy trees of the same species. Dead ash trees were seen as far north as Laconia, New Hampshire.

Chlorotic dwarf (white pine blight ?) -- chlorotic dwarf of white pine may be seen commonly in southern New Hampshire, north and central Massachusetts, and along Route 17 in southern New York.

White pine forking -- a New Hampshire collaborator reports noting the trouble on many young trees in southern New Hampshire and Maine. He adds, "I would like to add virus to the list of suspected causes, since there is a stimulation of growth, abnormal growth of terminals, and odd number of needles produced." Forking of white pine and white spruce is reported as commonly observed in central New Hampshire. White pine forking is said to be especially severe this year in Vermont; also similar symptoms have been found on Norway spruce and balsam fir. The Vermont report concludes with "between weevil, rust, the aphid, and now forking, some of our foresters are getting awfully discouraged with white pine."

Leaf scorch of several species, but principally sugar maple, is very conspicuous in many northeastern areas. It is believed to be due, at least in part, by the sudden occurrence of dry weather following the lush growth this spring. Declining or otherwise weakened trees are most severely affected.

A few late reports of winter injury and frost damage were received. Late frost damage is reported on Scotch pine and white spruce from the Lowville, New York section. Scattered, moderate to heavy, winter injury is reported on some red spruce; also ash, fir, and some oak were hit by late frosts.

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Some recent publications of interest are:

1. Brandt, R. W. 1960. The Rhabdocline needle cast of Douglas-fir. Univ. of New York, Coll. Forestry, Tech. Publ. No. 84, Syracuse, N.Y. 48 pp., illus.
2. Drooz, A. T. 1960. The larch sawfly, its biology and control. USDA Tech. Bul. No. 1212, 52 pp., illus.
3. Fergus, Charles L. 1960. Illustrated genera of wood decay fungi. (An illustrated key to genera and families of wood decay fungi.) Burgess Publ. Co., Minneapolis 15, Minn. \$4.00
4. Pirone, P.P., B. O. Dodge, and H. W. Rickett. 1960. Diseases and pests of ornamental plants. 3rd ed. The Ronald Press Co., New York. x + 775 pp. \$10.00